Transactions of the Royal Society of London, from 1830 *to* 1837, *inclusive.* Vol. III. 1830 to 1837. Presented by the same.

Proceedings of the Royal Society of London. Nos. 28, 29, 30. Presented by the same.

Journal of the Royal Asiatic Society of Great Britain and Ireland. No. 8. Presented by the Society.

Essays on Unexplained Phenomena. By Graham Hutchinson. Presented by the Author.

On the Functions of the Cerebellum, by Drs. Gall, Vimont, and Broussais. Translated from the French by George Combe. Also, *Answers to the Objections urged against Phrenology by Drs. Roget, Rudolphi, Prichard, and Tiedemann.* By George Combe and Dr. A. Combe. 8vo. Edinburgh, 1838. Presented by George Combe, Esq.

Bulletin de la Société Geologique de France. Tom. IX. Feuilles 1—5, 1837 *à* 1838. Presented by the Society.

March 26. (Adjourned Meeting.)

SIR Wm. R. HAMILTON, A. M., President, in the Chair.

A paper, by Mr. Carroll, on the Motion of the Boomerang, was read. In this paper the author seeks to explain the properties of the flight of the weapon by assimilating the effect of the air's resistance on it to that exerted upon a flat circular disc.

Professor Lloyd, V. P. made a few observations upon the same subject, in which he endeavoured to show that the peculiar movement of this projectile was but an extreme case of acknowledged laws. When a body moves in a resisting medium, and when the resultant of all the forces of resistance, which act upon the several portions of its surface, is not contained in the vertical plane of projection, the body must deviate from that plane. This is generally the case in

the motion of a body in a resisting medium. This effect of the air's resistance can be shown to be unusually great in the case of a body (like the boomerang) composed of two straight arms united at a large angle, and projected with a revolving motion; and hence the large resulting deviation in this case, amounting (as is known) to 180°. Mr. Lloyd observed, however, that this anomalous deviation was by no means peculiar to a projectile of this form; and that there were even other shapes which exhibited the property in a more remarkable manner.

The other peculiarity in the flight of the boomerang, namely, its alternating ascents and descents, were ascribed by Mr. Lloyd to a *nutation* in the axis of revolution; the instrument (on account of its flat shape) being compelled to move in its own plane, which is also the plane of rotation. The motions of *translation* and of *rotation* of a heavy body in a *resisting medium* are not independent of one another, as they are *in vacuo;* and hence the variations of the progressive movement will produce corresponding variations both in the velocity and direction of the rotation.

———

Professor Lloyd read a letter from Mr. Knox, detailing some results of the performance of his rain-guage, during the months of August, September, and October, and describing a mode in which these results were *graphically* registered. The following is an extract :

" Drawing from a centre eight lines, to correspond with the cardinal and intermediate points, I take on each line a space respectively proportional to the amount of rain that has fallen from that point during any month; connecting the point so taken, I get a curve (or rather an eight-sided figure) which exhibits at one view both the amount and character of the rain during the month. It also enables the observer to compare one month with another, and likewise to get a mean curve for the season, which may be of great use in determining local climate. It is probable that the

mean curve for the three winter months may have the same character, if not the same magnitude, during different years. The line for August, for example, has shot down far to the S. W. which was owing to a few violent thunder storms from that direction. The curves for September and October have gone more to the west; and it is probable that in Spring I shall find the curve extending more to the easterly side of the compass, as our then prevailing winds are from that quarter.

"Another important thing with regard to climate may be obtained by using this guage in conjunction with Whewell's anemometer; for by drawing in the same manner and on the same paper, the *amount* of wind from each of the eight points for any month, we may see at once the comparative dryness or wetness of any wind, (I mean with regard to *rain*, not vapour,) which the mere amount of rain from the different directions would not give."

The following table exhibits the amount of rain during the three months above mentioned:

	August.	September.	October.
S.	0.342	0.862	0.042
S. W.	1.434	1.226	0.836
W.	0.214	0.954	1.021
N. W.	0.052	0.572	0.251
N.	0.199	0.515	0.148
N. E.	0.050	0.248	0.016
E.	0.026	0.065	0.003
S. E.	0.080	0.195	0.019
Total	2.397	4.637	2.336

A paper was read "on some Snow Crystals observed on the 14th of January, 1838," by William Thompson and Robert Patterson, Esquires.

The crystals, which form the subject of this paper, were observed by the authors among the ordinary snow-flakes, in

a shower which fell at Belfast on the 14th of January; the crystals appearing to constitute fully one-third of the snow that fell. Nineteen distinct forms were observed, and are described in detail in the paper. Most of them are identical with those delineated by Hooke, Nettis, and Scoresby; there are some, however, which do not appear to have been before observed. They all belonged to the " lamellar," or first of the genera into which they are divided by Scoresby. The size of the crystals generally exceeded considerably that of those observed by the above-mentioned authors; their average diameter being such that the naked eye could readily discriminate the various figures, as they lay on a dark ground.

From the great variety of figures observed in the course of a very limited time (a single hour) it is inferred by the authors, in opposition to the opinion of Scoresby, that a considerable range of temperature is not essential to the production of very various forms.

The weather for some days previous had been frosty, and the barometer gradually falling from about noon on the 12th. On the morning succeeding the day in which the observations were made, there was snow, succeeded by showers of sleet; and at noon a heavy rain set in, and continued without intermission the remainder of the day.

The President, in presenting the copy of the Arenarius of Archimedes, described in the donations of this evening, stated that he had intended to offer some remarks on that relic of mathematical antiquity; but announced that he considered it unnecessary to do so, on finding that his remarks had been, to a great extent, anticipated by Professor Rigaud of Oxford.

Professor Lloyd communicated the results of a paper " on the Annual Decrease of the Dip in Dublin."

It is well known that the dip has been diminishing in

Europe from the time of the earliest observations, and that the rate of this diminution is not uniform. It is, accordingly, a question of considerable interest and importance to determine the precise amount of the annual decrease, for a given epoch, at any station. Conceiving that the observations of dip in Dublin, though extending over a very limited time (three years), were yet sufficiently numerous to furnish a close approximation to this amount, the author has put them together with that view. The observations are thrown into five distinct groups, those of the same group having been made nearly at the same time. The following are the results:

	Date.	No. of Obs.	Dip.
I.	Oct. 21, 1833,	1.	71°. 9'. 1.
II.	Sept. 9, 1834,	10	71°. 7'. 1.
III.	Sept. 18, 1835,	16	71°. 5'. 2.
IV.	April 25, 1836,	8	71°. 3'. 9.
V.	Aug. 5, 1836,	4	71°. 1'. 7.

The observations of M. Kupffer clearly show, that the diminution of the dip is not uniform throughout the year; but that from December to May it is nearly stationary, the whole diminution taking place in the remaining eight months. For the convenience of calculation, we shall assume that the diminution takes place at a uniform rate throughout these eight months. It is evident then, that if δ denote the *unknown* dip at an *assumed epoch*, the 1st of January, 1836; $\delta_{\prime}$ the dip *observed* at any other time; n the number of *effective* months in the interval; and ε, the *monthly decrease*, each of the above results will furnish an equation of condition of the form

$$\delta + n\varepsilon = \delta_{\prime}.$$

Combining these five equations by the method of least squares, we obtain two resulting equations which give the most probable values of δ and ε. We thus find,

$$\delta = 71°. 3'.84, \qquad \varepsilon = 0'.97.$$

Hence the *annual decrease* of the dip in Dublin (or 8 ε) is
2′. 38.

The close agreement of this result with that recently
deduced by Major Sabine, from his observations at the
Regent's Park, is very remarkable. From these observa-
tions it appears that the dip has undergone a diminution of
39′ at London, in the interval between August 1821, and
November 1837, an interval of 16¼ years. The annual de-
crease, therefore, is 2′.40.

RESOLVED, on recommendation of the Council,—" That
as a first step towards the attainment of greater regularity
of payment by members in future, the five following de-
faulters, being deeply in arrear, be now excluded from the
Academy, and declared to be no longer members thereof;
but, as a measure of indulgence, that they be not sued at
law for their arrears :

	£	s.	d.
Henry Grattan Douglas, M. D., *in arrear*,	37	16	0
Thomas Little, M. D. . . ——.	37	16	0
John L. Arabin, Esq. . ——	33	12	0
Gerard Macklin, Esq. . . ——	27	6	0
William Shaw Mason, Esq. . ——	23	2	0 "

RESOLVED,—" That the portion of the By-law, Chapter
VIII. Section 4, which forbids the commencement of a new
paper after 10 o'clock, be suspended for the present."

DONATIONS.

Hortus Mauritianus. Par W. Bojer. 8°. Maurice, 1837.
Presented by Lord Glenelg.

Transactions of the Geological Society of London. Second
Series, Vol. V. Part the First. Presented by the Society.

*The Greek Text of the Arenarius of Archimedes, believed
to have been edited by Dr. Moor of Glasgow.* Presented,
through the President, by Professor Russell of Edinburgh.

the by-law Chap. 7, Sect. 8, be repealed, and the following substituted :

" The Council shall, from time to time, award medals, or other honorary rewards, at their discretion."

DONATIONS.

Comptes Rendus Hebdomadaires des Séances de l'Academie des Sciences. Premier Semestre, Nos. 12 and 13. Presented by the Institute.

Genealogical Tables of the Sovereigns of the World. By the Rev. William Betham, of Stonham, Suffolk. Presented by Sir William Betham.

ERRATUM

IN THE LAST NUMBER OF PROCEEDINGS.

Page 149, last line, *for* 0'.27, *read* 0'.297.